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When "Silver Hair" Enters the Digital Age: A Study of Aging in Audiobook Apps

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Abstract**—***In the age of converging media, it is critical to satisfy the specific reading demands of the elderly. It is critical to actively address their reading needs and give high-quality cultural products, therefore assisting senior people in bridging the digital gap. This study focuses on Chinese audiobook applications and explores how to better adapt these apps to the national setting. The goal is to empower senior Chinese individuals to use mobile internet more efficiently, hence improving service delivery and closing the digital gap.*

Keywords**—** *Elderly population, audio literature, Himalaya, YunTing, age-friendly adaptation.*

I. INTRODUCTION

Based on the 49th Statistical Report on China's Internet Development published by the China Internet Network Information Center, by 2021, internet users aged 60 and above reached 119 million, accounting for 43.2% of all internet users in the country. Among these elderly internet users, 69.7%, 52.1%, and 46.2% can independently perform online tasks such as presenting health codes/travel cards, purchasing daily necessities, and searching for information[1] . The topic of the digital divide, which has accompanied the fast expansion of the internet, was widely discussed during the 2022 National People's Congress. Most mobile applications, with the backing of national regulations, have integrated "care mode" and "elderly mode" to assist the elderly in integrating into the digital age[2] . In current digital age, audiobook platforms are the major way for the elderly to listen to radio and audio information. The Broadcast Listening and Audio Development Report 2021, published by CSM Media Research, shows a strong growth in the number of mobile audio listeners, particularly among the silver economy group aged 45 and up. However, existing audiobook platforms often do not adequately address the needs of elderly users. Therefore, this paper aims to identify the specific needs of elderly users, particularly when using audiobook platforms, and to explore optimization strategies based on the user experience of the elderly. This is intended to better facilitate the use of mobile internet by the elderly and to bridge the digital divide.

II. THE URGENCY OF ADAPTING AUDIOBOOK APPS FOR THE ELDERLY

Firstly, Mobile Phones Have Become an Important Source of Media Access for the Elderly. A study on media consumption among the elderly by Bowen Meng and Wentai Yin indicates that 75% of the elderly prefer mobile phones to televisions[3] . This finding challenges the conventional notion that the elderly favor traditional media such as radio and television and reveals a greater-than-anticipated acceptance of smartphones among the elderly. Smartphones have become an indispensable part of their daily lives and are even showing a trend of replacing televisions. In this context, adapting audiobook apps to be more accessible for the elderly, by updating software settings and content based on the needs and preferences of elderly users, is crucial. This approach will help the elderly access and engage with new content, enhancing their capacity for information acquisition and self-improvement, thereby contributing to bridging the digital divide.

Secondly, Audiobooks Align with Elderly Information Consumption Habits. For individuals born in the 1940s and 1950s, many crucial announcements and information were traditionally disseminated through broadcast media. These elderly individuals have developed a strong habit and dependency on radio, maintaining a high level of trust and loyalty towards it, thus becoming significant audiences for broadcast media. Audiobooks represent a contemporary digital media format closely integrated with daily life, catering to the social and entertainment needs of the elderly. Compared to television viewing, audiobooks are more conducive to preserving the visual health of older adults. Moreover, seniors typically have more leisure time and are more inclined to listen attentively, ensuring they fully engage with program content.

Thirdly, Audiobook Apps Enhance Elderly Well-being. The mechanism by which media exposure affects subjective well-being is a classic issue in media effects and media psychology[4] . Several countries have observed a positive correlation between internet usage and the subjective well-being of older adults[5] . Internet use can foster close intergenerational relationships, thereby enhancing elderly individuals' overall sense of well-being[6] . By engaging with audiobook apps, seniors can access beneficial information and health knowledge, expand their social circles, and strengthen connections with family and friends. These activities help mitigate feelings of loneliness and contribute to improved physical and mental health among the elderly.

Finally, Enhancing Elderly Leisure Life is Essential in Aging Society. The development of new media requires respecting the acceptance and needs of elderly individuals, enabling them to integrate into and enjoy the convenience and pleasures brought by new media formats. Audiobook apps

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closely align with the entertainment needs of the elderly and should actively undergo age-friendly adaptations to enhance services tailored to this demographic. By providing higher-quality broadcast content and services, these apps ensure that elderly individuals are not marginalized in the era of new media, thereby demonstrating societal responsibility and media care.

III. Comparison of Two Audiobook Apps

There are many audiobook apps available on the market, among which Himalaya and Yuntin are two relatively popular choices. These two apps have distinct characteristics: Himalaya primarily focuses on user-generated content (UGC), allowing users to upload and share their own audio content, while Yuntin mainly features professionally generated content (PGC) produced by contracted audio content production teams. Despite their differing features, both apps need to consider the preferences of elderly users in terms of user-friendliness.

Himalaya App is the most rapidly growing and largest audio content-sharing platform for audiobooks in China. This platform gathers a vast amount of UGC and features contributions from outstanding creators. Within the Himalaya App client, UGC constitutes a substantial portion, allowing users to publish their own audio works such as readings of articles, storytelling, singing, and more. This facilitates sharing, interaction, and communication among users.

For elderly users, Himalaya App has been specifically optimized. The app incorporates features like large fonts, high contrast, and a clear, user-friendly design, making it easier for elderly users to navigate and operate. Additionally, the app includes voice playback and voice search functionalities, which cater to elderly users with visual or hearing impairments. Moreover, the app offers a dedicated "Senior Zone" where a series of audio programs and audiobooks tailored for elderly users are available. These cover diverse topics including health preservation, humanities and history, and classic Chinese studies, meeting the varied content needs of elderly users.

YunTing APP is a new media platform launched by China Central Radio and Television General Administration. It focuses on three main sections: "Listen to Fine Works," "Listen to Radio," and "Listen to TV," primarily featuring PGC content. The platform is renowned for its professional broadcasters and hosts, aiming to meet users' demands for high-quality content. For elderly users, YunTing APP emphasizes personalized and scenario-specific experiences, catering to those accustomed to traditional radio and TV programs.

In terms of elderly-friendly features, YunTing APP addresses seniors' information consumption habits and issues related to declining visual and auditory capabilities. It offers practical features such as one-click resume playback and exclusive listening playlists, along with voice interaction tools, to facilitate easier usage for the elderly.

IV. Issues and Shortcomings

To sum it, YunTing APP and Himalaya APP each possess distinct advantages in the realm of audiobook applications. Nevertheless, these applications still encounter significant challenges for elderly users, including interface complexity, high thresholds for interaction components and gestures, varying content quality, and deficiencies in privacy and security safeguards.

Firstly, Most elderly consumers prioritize the convenience and functionality of app operations. According to surveys conducted by Jin Yan, Liu Ziqi, and others, 89.3% of elderly individuals believe that "font customization" should be the primary adjustment to alleviate common visual impairments. Currently, some apps with built-in modes tailored for the elderly can globally enlarge font sizes and adjust line spacing. However, the elderly version of the Himalaya APP still has issues such as overly dense fonts that obscure a significant amount of information and inadequate font size enlargement, making it challenging for users to adjust. Furthermore, the category buttons in the Himalaya APP are represented by four black dots in the upper right corner of the page without accompanying text, which makes it difficult for elderly users to quickly associate each "black dot" with specific channels.

The YunTing App also encounters challenges in this area. The app's search box and voice recognition button are relatively small. Additionally, it lacks a distinct "View All" function to display all program content, potentially leading elderly readers to erroneously assume that the app exclusively features these few programs, thereby diminishing their enthusiasm for audiobooks. Moreover, some module names in the news section exceed the interface's display capacity, which could cause confusion and uncertainty among elderly readers regarding the news content[7] .

Secondly, For elderly users, their main demands revolve around health information and current affairs. However, health information requires a high level of scientific accuracy and professionalism, demanding advanced skills and scientific literacy. Due to the absence of effective technologies for identifying, processing, and utilizing information, audiobook apps fail to adequately deliver high-quality health information to elderly users, resulting in the proliferation of low-quality health information.

Especially concerning the Himalaya App, internal advertisements are pervasive and spam notifications are incessant, significantly impairing the user experience for elderly individuals. There are instances where advertisements disguised as "health communication" promote shopping products, leveraging enticing slogans like "healthy exchange" to compel elderly users into extensive spending. Despite the widespread adoption of online shopping, elderly individuals often lack sufficient understanding of online communities, exacerbated by malicious instigation from marketers, leading to numerous issues and controversies. Many masquerade as providers of "health services" while their primary aim is personal profit.

For instance, in the "Health and Wellness" channel of the Himalaya App, elderly users are primarily interested in

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gaining insights into traditional Chinese medicine and pharmaceuticals. However, upon accessing this channel, they encounter predominantly weight management and cosmetic enhancement topics, which appeal more to younger women. Elderly individuals, marginalized in society for an extended period, exhibit a strong interest in current trends. Yet, the headlines that dominate are driven not by professional media but by sensationalized content, leading elderly users to click on misleading headlines. This situation underscores the urgent need for the Himalaya App to address these issues. While it is challenging for moderators to oversee all content quality comprehensively, prioritizing the introduction of accurate content aligned with the interests and preferences of elderly users is crucial for enhancing their experience on the app[8] .

Furthermore, homogenization of content remains the primary challenge across various platform productions. Within audiobook apps, YunTing, predominantly driven by PGC, encounters significant issues in this regard. Despite offering customized program albums specifically for elderly users, these albums often include episodes released six months to a year ago without subsequent updates. Additionally, much of this content is deemed irrelevant by users, consisting of excessively repetitive material that adversely affects user choice and significantly diminishes user experience.

V. Path Optimization

(1) Introducing a Simplified and Convenient Elderly Mode

While many apps prioritize adapting for teenagers with specific modes tailored to their needs, it is equally important for audiobook apps catering to elderly audiences to introduce an elderly mode. This mode aims to meet the cognitive requirements of older users who often struggle with overly complex interfaces and operations. Simplifying interface designs and operational processes can significantly enhance elderly users' understanding and usability of audiobook apps.

Firstly, interface design should prioritize simplicity and clarity, avoiding overly complex operations. Enlarging font size, adjusting letter and line spacing, facilitates easier readability and operation for elderly users. Additionally, minimizing the use of icons and animations for components, and enhancing textual prompts, improves the comprehensibility of interface elements. However, it is crucial to mitigate issues where excessively simplistic designs may obscure information. Furthermore, section titles should be straightforward and avoid sensationalism, emphasizing clarity to enhance users' understanding and cognition of app functionalities.

Secondly, clear navigation pathways are essential for elderly users. They often require straightforward interfaces to navigate apps effectively. Therefore, it is crucial to design a clear navigation bar and menu, alongside intuitive operation buttons and prompts that provide explicit instructions. This will assist elderly users in completing tasks. Moreover, some functions can be accessed through simple voice commands, facilitating easy navigation to desired functions or content.

Additionally, the registration and login processes should be simplified. Elderly individuals often struggle with handling complex registration and login procedures. Therefore, apps should be designed with simple and intuitive registration and login pages, incorporating methods such as SMS verification to reduce the operational steps for the elderly.

After activating the senior mode, the channel setup should better cater to the needs of elderly users. It should offer news and current affairs broadcasts akin to those found on professional news platforms, enabling the elderly to stay informed about national and international events and maintain pace with societal advancements. Additionally, it is crucial to provide scientifically authoritative health and wellness broadcasts, ensuring their authenticity, accuracy, and professionalism while avoiding the dissemination of commercial promotions or misleading information. Furthermore, cultural and artistic broadcasts play a vital role in fulfilling the spiritual and cultural needs of older adults, including genres such as cross talk, storytelling, traditional opera, and songs. Additionally, there is potential to offer interest-based broadcasts similar to the storytelling format, covering historical and literary works.

(2) Enhancing Interaction and Social Experience

As the number of empty-nest elderly continues to rise, they increasingly experience loneliness and seek attention. Audiobook apps should prioritize the needs and emotional well-being of elderly users in their design, demonstrating the media's humanistic concern. Moreover, these apps should actively engage with elderly users, gaining insight into their needs and concerns to offer superior services, thereby fostering feelings of care and warmth. To improve the interactive experience for elderly users, audiobook apps can focus on the following areas:

On the one hand, strengthens the connections between users, allowing elderly users to add friends through convenient methods such as phone numbers, WeChat, QQ, etc. They can also use the "People You May Know" and "Invite" features to broaden their social network within the application. Additionally, in the chat and community sections, social groups can be established to facilitate connections between elderly users and like-minded individuals. Within these groups, they can chat, share, and exchange images, enhancing social interaction and participation. This way, elderly users can better maintain contact with friends and family, thereby enhancing user engagement.

On the other hand, it is essential to enhance the interaction between elderly users and the hosts and creative teams. In the live streaming section, the application can offer options for hosts aged 20-30 and those over 50 to engage the interest of elderly users. Hosts aged 20-30, who are similar in age to their children, can provide a sense of companionship often missing in daily life, helping elderly users feel happier and less lonely. Additionally, elderly users interested in participating as hosts can be recruited within a designated period. Through this approach, elderly users can better understand their own needs and resonate more with their peers, fostering a sense of closeness. This interaction model can more effectively address the emotional needs of elderly users, promote meaningful exchanges between elderly users and the media, and reflect the media's care and humanistic concern for elderly users.

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Besides online services, some offline services can extend into the social community. For example, traditional hotline feedback mechanisms and leveraging community outreach programs to regularly contact communities or nursing homes with a large number of elderly users. Organizing small activities such as reading competitions or classic song-singing competitions can provide services that address the emotional needs of the elderly. This approach helps to improve the loyalty of elderly listeners, foster closer relationships with elderly users, and encourage their active engagement. These activities not only make elderly users feel valued and cared for but also enhance their loyalty to the platform.

(3) Ensuring Content Quality in Elderly Care Service Platforms

Firstly, for elderly care service platforms, assuming responsibility for stringent quality control is crucial. In today's digital era, branded content programs are gaining traction as the primary medium of consumption.

Secondly, In UGC-based audiobook apps, incentivizing outstanding creators effectively mitigates the spread of inferior content. Additionally, implementing robust user feedback mechanisms and ensuring intellectual property protection is vital for safeguarding the rights of original creators. These measures foster a constructive cycle and promote the sustainable growth of the industry.

Thirdly, Based on professionally curated content (PGC), audiobook apps possess significant advantages in terms of content, resources, and distribution channels. They efficiently utilize and regularly update extensive databases to avoid mere duplication of existing materials. Through proficient development, these applications can leverage unconventional dissemination platforms, thereby enhancing media value.

Fourthly, it is crucial to mitigate issues such as excessive advertising and unsolicited push notifications. These can pose challenges for elderly users, potentially leading to inadvertent clicks on advertisements or privacy breaches. Voice reading apps optimize their advertising strategies and implement spam filtering mechanisms to manage and reduce the impact of unwanted notifications.

Fifth, it is crucial to mitigate issues related to excessive advertising and unsolicited notifications. These pose significant challenges for elderly users, who may unintentionally interact with ads or compromise their personal information, thereby negatively impacting their user experience. Audiobook applications can optimize ad strategies, integrate anti-spam mechanisms to efficiently detect and filter large volumes of unwanted content, regulate ad frequency and placement, and enhance the overall reading experience[9] .

(4) Integrating AI Technology Including Smart Speakers

With the rapid development of new technologies such as big data, cloud computing, and artificial intelligence (AI), mobile broadcasting apps should keep pace with these advancements to continuously enhance their offerings.

Voice-based reading applications, in addition to utilizing AI technologies like voice recognition, intelligent assistants, and user algorithm analysis, can also leverage smart speakers and similar devices to facilitate intelligent interactions between mobile broadcasting apps and users. For instance, users can interact with the app via smart speakers to request actions like playing their favorite programs. The app can autonomously respond to user queries and preferences, enabling hands-free interaction and improving accessibility for elderly users. This approach enhances the app's usability and encourages frequent use among elderly users.

In summary, The study recommends that audiobook apps enhance user interfaces to better suit the needs of elderly users, offer higher-quality content, and foster greater user interaction among the elderly. Furthermore, our analysis reveals varying emphases on elderly-friendliness among different apps, offering valuable perspectives for optimizing audiobook apps. Future research should delve deeper into digital product applications among the elderly to effectively meet their specific requirements. We trust that this research contributes to enhancing elderly users' experience with mobile internet applications and bridging the digital divide.

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